AquaTechnex

"Advancing the Science of Lake Management"

Big Lake
Lake Management District

2002 Year End Report

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Introduction

Big Lake is a 520 acre water body located in Skagit County Washington. This lake is relatively shallow and has been impacted by the introduction of two invasive aquatic weed species. In the mid 1990's the citizens living around the lake organized a committee to investigate control options. This committee teamed with Skagit County Department of Public Works and took the first step of developing an Integrated Aquatic Vegetation Management Plan (IAVMP). This plan identified two invasive weeds as causing the bulk of the problems in Big Lake.

Brazilian Elodea was the primary problem plant found in the lake. This weed has been widely distributed in the aquarium trade. In those days, it was routinely found in Washington pet and aquarium store for sale. It is thought that some owners of aquariums let their fish go in lakes and the weed is introduced in that fashion. It can also be spread from lake to lake on boat trailers once established. This weed infested the majority of the littoral zone in Big Lake out to the 13 foot contour. There were 177 acres of the lake heavily impacted by this noxious weed.

Eurasian Milfoil was also present in Big Lake at what would be considered pioneering levels. There were a number of patches of this plant that were from 100 square feet in size up to a quarter acre. Eurasian Milfoil at that time was also present upstream from Big Lake in Lake McMurray. As this weed spreads primarily by fragmentation, it is possible that this plant had moved from McMurray downstream to Big Lake.

Both of these plants pose a serious threat to the aquatic environment. They replace native plant communities and can displace the organisms that have evolved to associate with those species. They can also depress water quality parameters critical to fish, they often cause elevated water temperatures and depressed oxygen levels within the plant beds. They also impact beneficial uses of the lake by the residents and visitors. As the areas around the public access were heavily infested with these weeds, Big Lake also served as a source to infest other lakes in the region by transport on boat trailers.

The citizens voted to form a Lake Management District with the help of the County. This entity received funding from the Washington Department of Ecology and collected dedicated tax revenues from the residents to implement the IAVMP. The first step in this process was to hire a service firm to manage the aquatic vegetation in the lake. Our company was selected to perform this work. A Sonar SRP treatment protocol was developed and applied to the lake in 1998 to target the invasive species. This treatment was highly successful. The Eurasian Milfoil was eradicated from the lake and the Brazilian Elodea was severely impacted. Brazilian Elodea has not yet been successfully

eradicated using this or other technologies in Washington State, but control was very good during 1998 and into the following years.

Since 1998, our team has met with the citizen steering committee each year. For a number of years after the 1998 treatment, Brazilian Elodea remained under control. Mapping efforts confirmed this. No additional aquatic plant management activities were necessary in 1999 and 2002.

By the summer of 2001, aquatic vegetation was again becoming problematic in the lake. There was extensive growth of a number of Potamogeton species that were impacting the use of the lake by residents. While these plants are not on the noxious weed list, when they form dense mats they cause the same problems as a noxious weed infestation with respect to water quality and impacts on beneficial uses. Brazilian Elodea was also making a comeback in the lake.

The summer of 2001 also saw changes in the regulation of aquatic plant management activities in Washington State. A lawsuit in Oregon was heard by the US Ninth Circuit Court of Appeals and the opinion rendered by that court cause confusion in the regulatory community. The Court ruled that an irrigation district in Oregon could be required to obtain an National Pollution Discharge Elimination System (NPDES) permit prior to the application of aquatic herbicides and that the use of these tools without this permit could be a violation of the Clean Water Act. While the herbicides used in lakes are much different than the particular product used by the irrigation district, the State Department of Ecology determined that this permit could be necessary for all treatments.

The Big Lake LMD was in a position in 2001 where treatment was desired, but without this permit available, a decision was made to wait until 2002 to see what the regulatory environment was like. During the winter of 2001-2002, the Washington Department of Ecology developed an NPDES permit for the use of aquatic herbicides. This permit was available for use in the late spring of 2002. With this permit available, the LMD determined that they could move forward with a treatment program.

2002 found the Big Lake LMD in the last year of its existence. Lake Management Districts are created by a vote of the property tax payers around the lake. These districts normally are set to solve a problem over the course of a few years and then sunset. The Steering committee determined that the best use of remaining funds in 2002 would be to treat the noxious weed growth present as described below and to present a proposal for a 10 year LMD to the citizens around the lake.

2002 Activities

The primary objective of the work on the lake in 2002 was to attempt to impact the Brazilian Elodea present with the remaining funds the LMD

had available for this work. As the community was planning to vote to authorize a new district starting in 2003 and because funds were not available to target the Brazilian Elodea with Sonar, the decision was made to target this growth with a contact herbicide.

The first step in the efforts for 2002 was to obtain coverage under the new NPDES permit to allow this treatment to proceed. The Department of Ecology issued a general NPDES permit for the control of noxious aquatic weeds to the Washington Department of Agriculture. Applicators targeting noxious weeds such as Brazilian Elodea then file a notice of intent to obtain coverage under that general permit. Aquatechnex filed this notice of intent as soon as this permit because active in May of 2002. This permit allowed the use of a number of aquatic herbicides. We selected Aquathol for use in 2002. Aquathol is a contact herbicide and is used to provide season long control of aquatic weeds. It is not the ideal herbicide to target Brazilian Elodea, but it is more cost effective than Sonar and was within the District's budget.

The next required step in the treatment process was to notify the public regarding this treatment. Our biologists developed a 10 day pre treatment notification and hand delivered it to all of the dwellings around Big Lake. This notification provided the lake residents with the treatment dates, the herbicide to be used and the water use restrictions that would be in place for a short period of time after treatment.

On July 9th, 2002 the Aquathol treatment was performed at Big Lake. The first step on the lake was to post the shoreline with signs notifying the residents that the treatment was occurring. This signage is required by the NPDES permit and provides the residents with the information regarding the water use restrictions in place. Letter sized signs were posted on all properties around the lake. Larger signs were posted at the public access sites and other boat ramps as required.

The treatment was made to 126 acres of the lake. The developed shorelines were the target of this application. The primary objective of this treatment was to provide relief from the impact of this noxious weed this summer until more long term measures could be applied under the new LMD in 2003. The application rate was 7.7 gallons of Aquathol per treated acre. Aquathol places a three day fish consumption restriction on fish cause within the treatment areas and a restriction on the use of treated water for irrigation or domestic use. This information was presented on the signs posted around the lake. We also recommended that swimming be restricted for 24 hours based on Ecology's recommendation. There is no swimming restriction on the US EPA label for this product.

Recommendations and Discussion

Aquathol does a good job of providing maintenance control of many noxious weeds including Brazilian Elodea. Aquathol is a contact

herbicide and controls the portions of a target plant that it comes in contact with. It does not translocate within the plant and control the root systems. As such, it's primary function is to remove vegetation from the water column and reduce the impact the weeds has on beneficial water uses for some period of time. Based on the budget available and the herbicides available under the NPDES permit in the summer of 2002, this product was the best of limited choices.

The Lake Management District has been renewed by a vote of the citizens around Big Lake for the next ten years. Brazilian Elodea continues to be a problem in the lake. During 2002, the Aquathol treatment was used to mitigate the impact of this noxious weed on water use in front of developed lots on the lake. Brazilian Elodea will recover from this contact herbicide treatment. It was also not targeted in the undeveloped south end of the lake in 2002 because of the budget limitations.

There are a number of new tools available to combat this noxious weed under the NPDES permit for 2003.

One of the most effective herbicides available to impact this plant systemically is Sonar Aquatic Herbicide. Sonar has a long contact/ exposure time requirement to be effective. In smaller lakes, the entire water volume is treated to maintain a lethal concentration of the herbicide in contact with the target weed for up to eight weeks. In a large lake system like Big Lake, this can be cost prohibitive. During the 1998 treatment, Sonar SRP (Slow Release Pellet) technology was used to effectively treat this weed. While this worked well, it took a considerable amount of time to impact the Brazilian Elodea. There are two new formulations of this herbicide available for use in 2003.

Another problem with the 1998 treatment was the timing. Brazilian Elodea has two windows during the year where it is most susceptible to herbicide impact. During the spring when the weed is actively growing it is more susceptible to this treatment approach than during the summer when it becomes somewhat dormant. The timing of Ecology's old permit system and the issuance of the contract in 1998 pushed the treatment back until the end of June. While this treatment was very effective, it took much longer for the Brazilian Elodea to be controlled by this application technology. The new NPDES permit allows for the application of the herbicide in a window that will result in better uptake and impact on this target.

While Sonar SRP was effective in controlling Brazilian Elodea during the 1998 treatment, the plants took a long time to react to this herbicide. Sonar SRP is a technology that has been designed to release this herbicide slowly over time. The herbicide is applied as a pellet. This pellet is designed to release the active ingredient over a period of 6 to 8 weeks and keep the plants continuously exposed to the herbicide as

required. During 1998, we made a number of applications to the lake to keep levels in contact with the weeds.

SePRO (the manufacturer of Sonar) has developed and received registration from the EPA for two new formulas of Sonar pellets. Sonar PR (precision release) is designed to deliver the herbicide at a more controlled rate to the target plants. This pellet releases the herbicide in a two to four week period, so more of the herbicide moves into the target plant faster. They have also developed a second pellet called Sonar Q (quick). This pellet expands as it hits the water and is not impacted by heavily organic sediments. It releases the herbicide over a period of 4 to 7 days. It is recommended that the Sonar treatments contemplated in 2003 be made with a combination of these patented technologies to improve the rate of control. It is also recommended that the timing of the treatments be moved forward into the spring to maximize impact on the Brazilian Elodea when it is most susceptible.

There is also a second option available for the management of Brazilian Elodea. Reward is a contact herbicide that provides excellent knockdown of this noxious weed. It performs better in this role than the Aquathol that was used in 2002. Reward was not available for use under the NPDES permit in the summer of 2002. While this herbicide is available for use in all other states, the Department of Ecology had for years denied its use in this state because of a 1992 Environmental Impact Statement the Department developed for the herbicide permit program. The Washington State Legislature directed Ecology to review this in the late 1990's. Ecology updated a Risk Assessment for this product and it will be allowed for use under the NPDES permit starting in 2003. As Reward is a contact herbicide, its use against Brazilian Elodea would be more effective in the years after an initial Sonar treatment. It should be used to suppress isolated areas of regrowth after the Sonar treatment is uses in the lake.

It may also be beneficial to hold another public meeting prior to work on the lake in 2003. In 1998, the community was very much behind the Sonar treatment and participated in the work on the lake by volunteering to post signs and perform other tasks. Since that time, there may have been significant turn over in home ownership on the lake and many of the residents may not have been involved in the initial treatments. A presentation to interested homeowners could help provide a better overview of conditions and the tools used in the lake.

If there are any questions on this report, please direct them to Terry McNabb at 360-647-5020.